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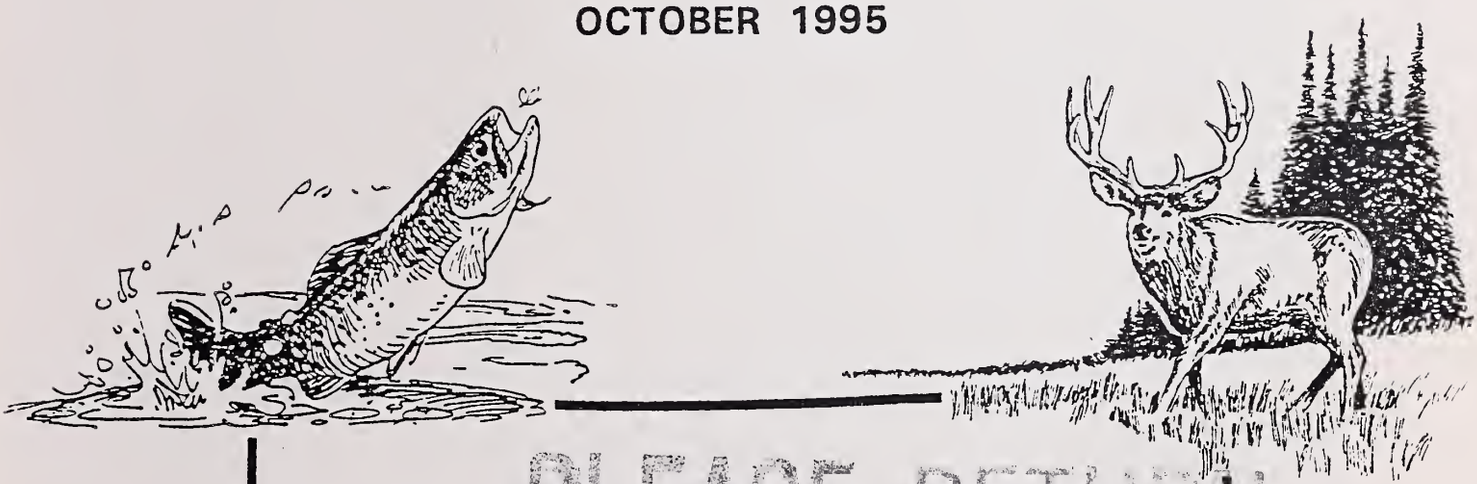
STATE OF MONTANA
NATURAL RESOURCE DAMAGE PROGRAM

REBUTTAL TO THE EXPERT REPORT OF DAVID EMMONS

PREPARED BY:
ALAN S. NEWELL

OCTOBER 1995



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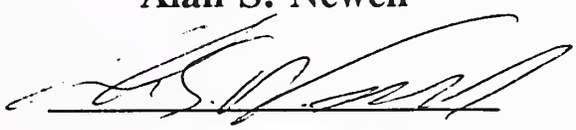
Rebuttal Report

Prepared for

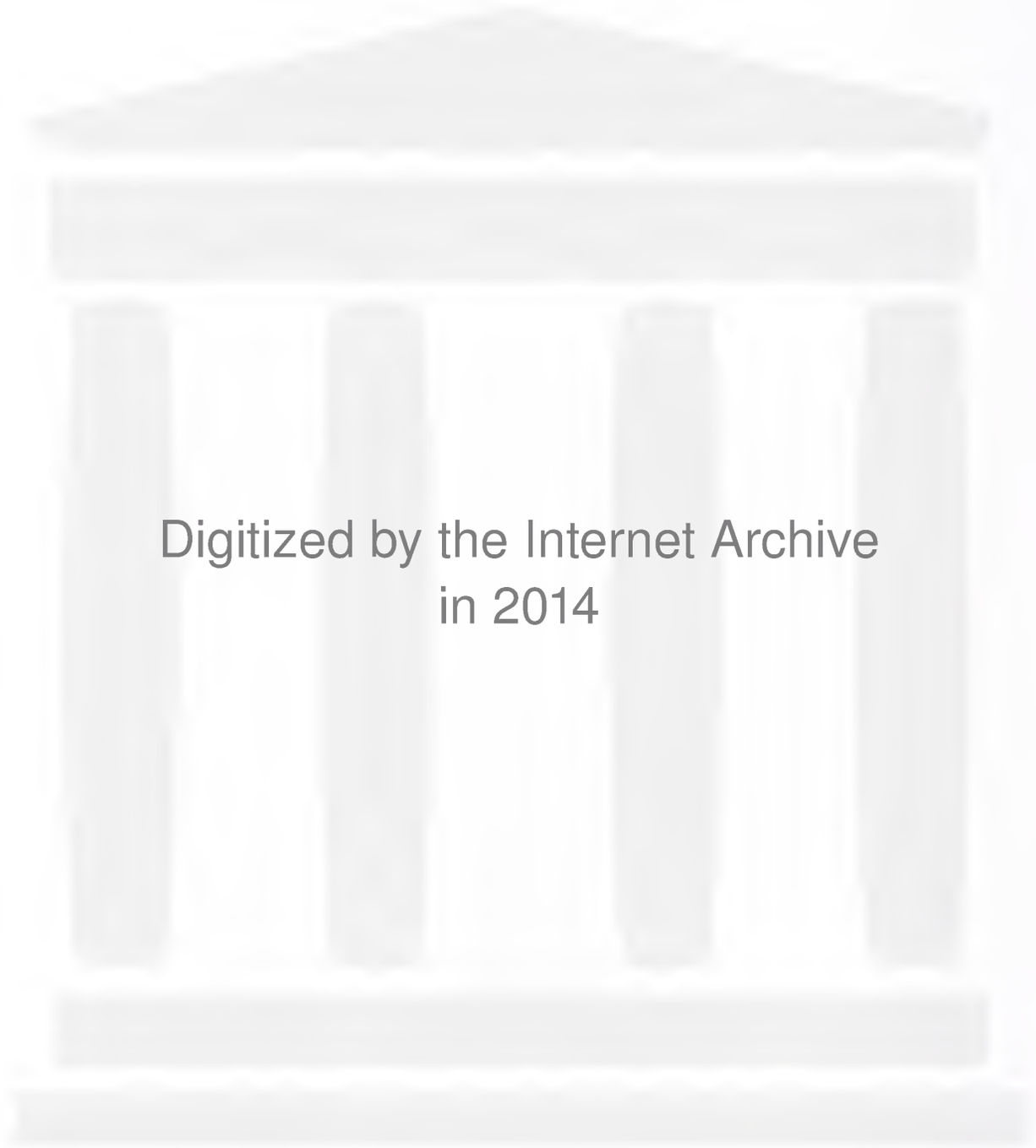
State of Montana
Department of Justice
Natural Resource Damage Litigation Program
Helena, Montana

by
Alan S. Newell



Missoula, Montana

October, 1995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I. Introduction

My name is Alan S. Newell and I have previously submitted a report in this case entitled "A Brief Historical Overview of Anaconda Copper Mining Company's Principal Mining and Smelting Facilities Along Silver Bow and Warm Springs Creeks, Montana." The State of Montana has asked me to review the report submitted by David M. Emmons on behalf of the defendant in this case, ARCO.

II. Rebuttal To "Introduction and Critique of State Expert's Opinions"

Professor David Emmons apparently has a mission. That mission is to correct the biases and prejudices that he believes are evident in Montana history. He is particularly concerned about how Montanans view the corporate legacy of the Anaconda Copper Mining Company (ACM) and why, in his opinion, they look to "The Company" to explain many of the economic and political ills that have befallen the state. While Professor Emmons' efforts to right the historical wrongs of Montana history may be laudable, they are neither accurate, original nor appropriate in this forum. More importantly, a careful review of many of the documentary sources presented in the Emmons report underscores the author's obvious tendency to overstate and, consequently, to misinterpret historical events. The following examples illustrate the problems with the Emmons critique.

Professor Emmons believes that the "most egregious error" in my report was the claim that the 585-foot stack that dominates the Anaconda skyline was constructed in 1903.[1] Apparently, he is unaware of the 300-foot stack that ACM constructed at the Anaconda Reduction Works in 1903. This 30-foot-diameter stack replaced four separate stacks that had operated since the "New Works" opening in 1902. Recognizing the inadequacy of this exhaust system, ACM undertook the renovations referenced in my report, including the erection of a new 300-foot stack. It was this stack that was replaced by the 585-foot, 60-foot diameter stack

[1] "Expert Report of David M. Emmons" (hereafter cited as Emmons Report), pp. 17-18.

that was completed in 1918 (not 1919 as noted in the Emmons' report), pursuant to a recommendation of the "Smoke Commission."[2]

A far more important problem with Emmons' interpretation of this event is his statement that the "Smoke Commission" "decreed" the construction of the new stack and other facilities in 1917. Emmons inaccurately states that the "Commission" had "operational authority over the management of the Anaconda Smelter's airborne wastes."[3] He tries to paint a picture of a compliant ACM, responding to the dictates of federal bureaucrats. He claims that the company's settlement of its lawsuit with the federal government occurred "in large measure because ACM agreed to implement the recommendations of the "Smoke Commission."[4] This characterization of the complicated events surrounding the ACM's pollution of the air in the Deer Lodge Valley ignores the opposite conclusions reached by the foremost historian of this issue.

Donald MacMillan's 1973 doctoral dissertation, "A History Of The Struggle To Abate Air Pollution From Copper Smelters Of The Far West 1885-1933," is the leading monograph on the history of air pollution in the Deer Lodge Valley. Although Emmons refers to that thoroughly researched document, he pointedly ignores MacMillan's evidence and conclusions. For example, MacMillan recounts in detail the political and legal maneuverings between officials of the Anaconda Company and Amalgamated Copper Company and the U.S. Department of Justice. The United States filed suit against the ACM only after it had tried unsuccessfully to get the company voluntarily to adopt proven technology to reduce sulphur dioxide emissions from the Washoe Smelter. Creation of a board of experts or "Smoke Commission" was part of the stipulated settlement that the parties negotiated during the winter of 1910-1911.[5]

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[2] Note that the document that Emmons relies on for information on the commission shows both stacks and clearly states that the 585-foot stack replaced the 300-foot tower. Arthur E. Wells, "Report of the Anaconda Smelter Smoke Commission Covering the Period from May 1, 1911 to October 1, 1920," UAM000176086.

[3] Emmons Report, p. 18.

[4] Ibid., p. 103.

[5] MacMillan's analysis of the negotiations leading to the stipulated settlement is lengthy and detailed. Donald MacMillan, "A History of the Struggle to Abate Air Pollution from Copper Smelters of the Far West, 1885-1937," (Ph.D. dissertation, University of Montana, 1973), pp. 224-301.

MacMillan reviews the background of the members of the commission and concludes that, while highly respected, they all had association with large mining and smelting interests. He adds, "Of the six experts engaged by the Commission to assess the various processes four were chemists and metallurgists of Anaconda Copper and two were physical chemists on 'furlough' from the Bureau of Mines working for the Westinghouse Electric Company."[6] This nexus of interests and events surrounding the issuance of the commission's recommendations leads MacMillan to conclude that this body ultimately "emphasized not what was achievable, but what it conceived as [commercially] feasible."[7]

MacMillan's arguments are compelling and should have been addressed in Emmons' narrative of the "Smoke Commission." A careful reading of MacMillan's monograph and the commission's 1920 report would reveal that the commission "recommended" and "suggested," rather than "decreed" changes to the Washoe Smelter.

Another example of Professor Emmons' overstatement and misinterpretation of historical events is his reference to construction of the ACM Timber Framing and Treating Plant at Rocker. Emmons states that my review of this facility "is a bit disingenuous" for not including the role of the U.S. Forest Service in the construction of that facility. He claims that this federal agency "developed the plans for its construction and oversaw both that construction and the plant's operation." The purpose of this plant, Emmons notes, was to treat "timbers cut from

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[6] MacMillan, "A History of the Struggle to Abate Air Pollution from Copper Smelters of the Far West, 1885-1937," p. 324. The same comment could be made for attorneys involved in the lawsuit, as Ligon Johnson, the Justice Department official responsible for negotiations with ACM from 1909-1911, later became "smoke counsel" to the American Smelting and Refining Company. See also Wells, "Report of the Anaconda Smelter Smoke Commission," pp. 18-20. It should be noted Westinghouse's experiments in the delivery of alternating current were integral to the expansion of mining in the Butte/Anaconda area. See Alan S. Newell, "A Victim of Monopoly: Samuel T. Hauser and Hydroelectric Development on the Missouri River, 1898-1912," (M.A. thesis, University of Montana, 1979), pp. 8-10, 18-21.

[7] MacMillan, "A History of the Struggle to Abate Air Pollution from Copper Smelters of the Far West, 1885-1937," pp. 327-328.

National Forests."[8] Emmons is again inaccurate and overly broad both in his critique of my report and his characterization of the history of this facility.

A careful and complete reading of the one and only document referenced by Emmons as support for his conclusions underscores the rather limited role that the Forest Service played in the Rocker plant — both in terms of the scope and the duration of its operation. As noted in that document, the Forest Service entered into a cooperative agreement with the ACM in May, 1909, with the goal of encouraging wood preservation and the use of lodgepole pine. The ACM apparently entered into the agreement with the sole goal of constructing a "wood-preserving plant."[9] The company's goal was surely met as, by September, 1910, the plant had been

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[8] Emmons Report, p. 12. Contrary to Professor Emmons' assertion that the timbers treated at the Rocker plant were cut on national forest lands, the ACM continued to treat materials at the facility that it obtained from lands it controlled in Montana, or other forested lands in Wyoming and western Washington. The ACM had access to timber cut by the Big Blackfoot Lumber Company, which, in 1910, it owned and controlled. See P.R. Hicks, "Reservation Treatment of Timber in Cooperation with the Anaconda Copper Mining Company," United States Department of Agriculture, Project Report, Project No. 44, February, 1911, Deerlodge National Forest Supervisor's Office, Butte, Montana, pp. 11-16.

[9] Hicks, "Reservation Treatment of Timber in Cooperation with the Anaconda Copper Mining Company," pp. 2-3. The Department of Agriculture's Division of Forestry, formed in 1879, was the immediate predecessor to the Forest Service. Under the able leadership of its first director, Bernard Fernow, this organization had responsibility for working with public and private entities to promote sound forest practices. The Division of Forestry had no land management responsibilities, even after creation of forest reserves in 1891 and 1897. Those reserves were managed by the Department of the Interior. The Bureau of Forestry's sole purpose was cooperative education, much of which was directed at industry. Not until creation of the Forest Service in 1905 and the appointment of the first "Chief Forester," Gifford Pinchot, did the new agency assume responsibility for the forest reserves, soon to be renamed "national forests."

As the nation's principal educator on forest uses and practices, the Bureau of Forestry introduced a number of cooperative programs with state, local and private interests. The programs included as forest inventories, fire danger assessments, and wood products utilization studies. A series of Bureau of Forestry "circulars," dating from 1898, describe the purposes and requirements of these programs. Circular 28, entitled "Practical Assistance To Users of Forest Products", authorized precisely the type of cooperative agreement that the Forest Service executed with the ACM at Rocker. One requirement of the agreement was that the sponsoring entity (in this case ACM) reimburse the Department of Agriculture for the expenses of government employees. U.S.D.A., Bureau of Forestry, "Practical Assistance to Users of Forest Products," circular no. 28 (Washington, D.C.: GPO, 1904) and U.S.D.A., Division of Forestry, "Practical Assistance to Farmers, Lumbermen, and Other Owners of Forest Lands," circular no. 21 (Washington, D.C.: GPO, 1898). For a general review of Forest Service cooperation with private business, see William G. Robbins, *American Forestry: A History of National, State and Private Cooperation* (Lincoln: The University of Nebraska Press, 1985), pp. 11-12; Harold K. Steen, *The U.S. Forest Service: A History* (Seattle: University of Washington Press, 1976), p. 74. See also Samuel P. Hays, *Conservation and the Gospel of Efficiency* (Cambridge: Harvard University Press, 1959); and Samuel T. Dana, *Forest and Range Policy: Its Development in the United States*, 2d ed. (New York: MacGraw-Hill, 1980).

constructed and was operating. The Forest Service, however, had a number of objectives that were not met by this agreement when it terminated on December 1, 1910, soon after completion of the facility.

The U.S. Forest Service cooperative role in the construction of the Timber Framing and Treatment Plant at Rocker was very limited. Although the agency did provide ACM with plans and specifications for the facility, it did so in an advisory capacity — one that was not atypical from other Forest Service activities during the early 1900s. The available documentation on this agreement suggests that ACM maintained control and authority over the construction and operation of the plant and, in most instances, did not accept Forest Service recommendations. [10] In any case, the cooperative agreement ended within three months of the plant's completion.

As these examples illustrate, Professor Emmons' effort to rebut my report rests on an incomplete reading of the materials cited in his report and a misunderstanding of the historical circumstances surrounding these events. These same problems are apparent with his "affirmative opinions."

III. Rebuttal To Defendant Experts' Affirmative Opinions

Professor Emmons seeks to minimize the role that the Anaconda Copper Mining Company played in the deposition of wastes in the Clark Fork River. He does so by emphasizing aspects of state sovereignty and political rhetoric that he believes evidence a state/ACM "partnership". Emmons claims that "Mining was Montana's raison d'etre" during "the first half-century of its existence." Consequently, he argues that any injury to the mining industry was an injury to Montana. More importantly, Emmons baldly asserts that, because of this partnership, Montana officials "knew everything its mining companies were doing."[11]

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[10] Forest Service Engineer P.R. Hicks specified 15 recommendations for the ACM in his final report for the Rocker project. He commented on 14 of these recommendations in his report. None of the 14 recommendations had been acted upon fully by the end of the agreement. ACM partially accepted 6 of the 14 recommendations and rejected the remaining 8. Hicks, "Preservation of Timber In Cooperation With The Anaconda Copper Mining Company," pp. 20-23, 89-92.

[11] Emmons Report, p. 59.

These statements are rash and inaccurate. Although few Montana historians would suggest that the mining industry was not important to the state's economy, they also would not dismiss the significance of ranching during the 1880s, logging in the 1890s, or dryland farming during the 1910s. As Clark Spence has noted, sometimes the interests of miners and ranchers collided, as they did during the 1885 territorial legislative session.[12] Moreover, to suggest that state officials were cognizant of "everything" that the mining industry was doing in Montana suggests a level of state regulatory oversight that simply did not exist in the late nineteenth and early twentieth centuries. The following few examples will suggest the level of hyperbole apparent in the Emmons report.

Statements by Territorial and State Governors Do Not Evidence a "Partnership" between the State of Montana and ACM

Professor Emmons cites a number of annual addresses by territorial and state governors of Montana in support of his argument that Montana formed a "partnership" with mining interests. He postures that Montana's "prosperity was dependent on mining" and implies that, in recognizing that dependence, state officials emphasized the mineral industry over other aspects of the state's economy.[13] Emmons overstates this economic sector and unreasonably stretches and misrepresents these gubernatorial pronouncements.

Read in their entirety, the governor's statements referenced by Emmons do not show an inordinate emphasis on the promotion of mining. Most of the early annual addresses, such as that of Sidney Edgerton in 1864, suggest that territorial officials were as interested in developing roads, establishing tax schedules and promoting education as they were with mining and other economic pursuits.[14] Governor Benjamin Potts' 1871 address is 29 pages long and

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[12] Clark C. Spence, *Territorial Politics and Government in Montana, 1864-89* (Urbana, Illinois: University of Illinois Press, 1975), pp 210-211. Spence is also noted for his numerous monographs on mining in Montana and the West. *The Conrey Placer Mining Company: A Pioneer Gold-Dredging Enterprise in Montana, 1897-1922* (Helena: Montana Historical Society Press, 1989); *Mining Engineers and the American West: The Lace-Boot Brigade, 1849-1933* no. 22, Yale Western American Series (New Haven: Yale University Press, 1970); and *British Investments and the American Mining Frontier, 1860-1901* (Ithaca, NY: Cornell University Press, 1950).

[13] Emmons Report, p. 34.

[14] Sidney Edgerton, "The Governor's Message To The Legislative Assembly of Montana," reprinted from the *Montana Post*, December 24, 1864, Montana Historical Society (MHS), pp. 1-7.

only a short nine line paragraph focuses on the territory's mining industry.[15] This concern for broader public issues was appropriate given that these officials knew that Montana's mineral wealth was attracting national attention. They were interested in using this economic activity to develop the territory's infrastructure and to seek statehood.[16]

Montana governors did, of course, emphasize the territory's mineral wealth when addressing its economic potential. But they did not do so to the exclusion of other interests, such as agriculture and stock-raising. Again, Sidney Edgerton's first and only annual address is instructive. Under the heading "Agricultural Resources", Edgerton proposed that "While mining, as now, will ever constitute the paramount interest, yet agriculture must form the enduring basis of our prosperity."[17] Similarly, Montana's first state governor, Joseph K. Toole, in his address to the second state legislature in January, 1891, emphasized that "Mining, Stock raising and agriculture, the three industries in which we are conspicuously successful, have made rapid strides in development."[18] Toole's speech is particularly interesting for its suggestion that irrigation would be important in expanding Montana's agricultural base. This argument paralleled similar views in other western states at the turn of the century and indicates the importance of the irrigation movement nationally.[19]

Mining was, of course, important to Montanans during its early period. It was more important to some governors than it was to others. Sidney Edgerton, for instance, had expectations of substantial economic gain from Montana's mineral riches. Edgerton's arrival in Bannack in 1864 as chief justice of Idaho Territory offered him an opportunity to invest in area

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[15] Benjamin F. Potts, "Message Of The Governor Of Montana," December 4, 1871, MHS, p. 28.

[16] For an overview of early interest in statehood, see Spence, *Territorial Politics and Government in Montana*, pp. 290-300.

[17] Edgerton, "The Governor's Message," pp. 4-5.

[18] Joseph K. Toole, "Message of Governor Joseph K. Toole To The Second Legislative Assembly Of The State of Montana," January 5, 1891, MHS, p. 1.

[19] Ibid., pp. 18-20.

mines. His ventures were apparently unsuccessful and Montana's first governor did not figure in the state's economic or political history after he left the Territory in 1865.[20]

The inability of Edgerton to separate personal from public interests was not uncommon in the nineteenth century. Territorial officials often had diverse financial interests and sought political office as a way to further private ventures. They believed that what benefitted them individually, would also benefit the public generally.

Samuel T. Hauser exemplified the self-interested politician. Hauser was a persistent entrepreneur, who won and lost fortunes in Montana's mining, banking and ranching industries. Hauser gained early fame as a silver miner and owned the St. Louis and Montana Mining Company near Philipsburg as well as an early silver refinery in East Helena. The passage of Hauser's 1885 gubernatorial report quoted by Emmons offers the governor's reflections on the past importance of gold and silver mining to the territory. The section of Hauser's report on "Silver", which follows that quoted by Professor Emmons, is more significant historically.

In this report, Hauser makes an impassioned plea for the maintenance of silver as a currency standard. His arguments are illustrative of the national debate over a silver and gold standard that raged during the 1880s and 1890s. Hauser, with his large investments in silver, was a solid "silver Democrat". He had much to gain personally from an increase in the mineral's currency value. Thus, as he reviews the affairs of Montana in this report, he uses this platform to argue for the importance of silver, not gold or copper mining, to the health of the territory. Hauser notes that:

> Our copper mines at Butte, with over two and one-half millions in their works alone, are barely paying running expenses. A very little further depreciation of their silver contents, and that industry is ruined, and thousands of men thrown out of employment.[21]

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[20] Edgerton invested in numerous mining claims during his short tenure in Montana. See James L. Thane, ed., *A Governor's Wife on the Mining Frontier: The Letters of Mary Edgerton from Montana* (Salt Lake City, UT: Tanner Trust Fund, University of Utah Library, 1976), pp. 61, 94. See also Spence, *Territorial Politics and Government in Montana*, pp. 243-247.

[21] "Report of the Governor of Montana" in "Report of the Secretary of the Interior," *House Executive Document 1*, Vol. 2, 49th Cong., 1st session (1885) pp. 1001-1003.

The governor exaggerated a bit perhaps. However, he had good reason for concern as the ultimate devaluation of silver following the Panic of 1893 and repeal of the Sherman Silver Purchase Act thrust the country into financial chaos and bankrupted Hauser.[22]

The views of territorial and state officials such as Edgerton and Hauser must be placed in proper historical context. Certainly these officials and others recognized the importance of mining to Montana. But, it is also true that each had other economic interests that they promoted and each had a personal agenda. To ignore the latter and emphasize the former distorts the history of this period.

The State of Montana's Control and Use of Montana Waters, Waterways and Adjacent Lands Does Not Evidence a "Partnership" with ACM

The notion that Montana's ownership of surface water and certain school trust lands is evidence of a state partnership with ACM also is at odds with the history of state regulation of these resources. The State of Montana owns the bed and banks of navigable rivers and streams in the state. The state also is the public trustee of all waters flowing in the state.[23] Despite this ownership, it has only been in recent years that Montana has developed a centralized regulatory structure that reflects its legal position.

The U.S. Army Corps of Engineers recognized the navigability of only a few waterways in Montana in the early 1970s. Following passage of amendments to the Federal Water Pollution Control Act in 1972, the Corps initiated a program to review the navigable status of a number of streams and rivers in the Missouri River Basin. Although the result of that effort did not lead to a formal declaration of navigability for more than a few waterways in the state,

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[22] For a discussion of S.T. Hauser's large investments in Montana silver mines and his support of bimetallism see Newell, "A Victim of Monopoly: Samuel T. Hauser and Hydroelectric Development on the Missouri River, 1898-1912," pp. 29-34.

[23] Albert W. Stone, *Montana Water Law* (Helena: State Bar of Montana, 1994); and "The Constitution of the State of Montana: The Constitution of Montana as Adopted by the Constitutional Convention March 22, 1972, and as Ratified by the People, June 6, 1972, Referendum no. 68," as printed in *Montana Code Annotated*, vol. 1 (Helena: Montana Legislative Council, 1993). Professor Emmons confuses Montana's ownership of "navigable waterways" and "navigable waters" in his report. Although Montana has title to the bed and banks of waters that were navigable at the time of statehood under the "equal footing doctrine," the bed and banks of non-navigable waterways that have passed to private individuals are owned by those individuals, not by the federal government as claimed by Emmons. Emmons Report, p. 62.

it did indirectly prompt state agencies in the early 1980s to look more closely at their authority.[24]

The Montana Department of State Lands first began requiring leases and easements for projects that crossed navigable streams in the state during the 1980s.[25] Following decisions in two cases — *Montana Coalition for Stream Access, Inc. v. Curran* and *Montana Coalition for Stream Access, Inc. v. Hildreth* — in 1984, the state expanded its regulatory authority under the "public trust doctrine" to all recreational waterways in the state.[26] The Montana legislature took its first action in this regard in 1985, with passage of the "Stream Access Law," which represented an effort by the state to classify waterways for the purposes of "title" or recreation.[27] The important point to note is that, although Montana may have had ownership of navigable and recreational waterways prior to 1980, it was not until that decade that state officials began recognizing that ownership and asserting their authority.

Similarly, Montana has trailed many western states in the development of a centralized system of water rights administration. Water rights in Montana, as in most western states, are governed by the doctrine of "prior appropriation." For most of the state's history, an appropriator could secure a water right simply by using the resource in a beneficial manner. The Montana Territorial legislature codified the procedure for notifying other parties of a water right in 1885, when it directed appropriators to post a notice at the diversion point and record the notice with the county clerk and recorder. As Professor Albert Stone has noted, even this

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[24] I was employed by the U.S. Army Corps of Engineers to research the history of navigation on Missouri River Basin streams in Montana during the mid-1970s. As a result of that research, the Corps officially declared the Yellowstone River navigable from Intake to Emigrant, Montana. It also recognized the navigability of the Missouri River from Fort Benton to Three Forks. Alan S. Newell and Gary Williams, "Missouri River Basin Navigability Study," prepared for the U.S. Army Corps of Engineers, Omaha District, 1974-1975.

[25] According to the Department of Natural Resources, the "equal footing doctrine" gave the state authority to require leases and easements for projects that crossed navigable streams. During the late 1970s and early 1980s, the State Department of Lands conducted research to insure that authority, and assembled a list of navigable streams in Montana. Phone interview with Lisa Axline, Scott Frickle, and Mary Lee Norris of the State Department of Natural Resources, September 18, 1995.

[26] Stone, *Montana Water Law*, pp. 162-166. I served as an expert witness for the Montana Coalition for Stream Access in the *Curran* case and consulted for the state in the *Hildreth* case.

[27] Ibid, pp. 164-166.

effort at regulation was limited since an appropriator still had the option of making "an appropriation of water from an unadjudicated stream either by following the 1885 statutes, or by simply following the rule of self-help."[28]

Unlike other states, Montana was slow to relinquish local control of water rights administration in favor of a central state system. Although Nevada, Colorado, Wyoming, New Mexico and other "prior appropriation" states established a strong "state engineer office" during the late 1890s and early 1900s, Montana's office, created in 1903, had limited authority. Reformers sought repeatedly to introduce a statewide permit system between 1903 and 1953, but faced rejection by legislators who steadfastly adhered to a local system.[29]

Not until 1972 were supporters of a centralized system able to secure a mandate for change. Delegates to the constitutional convention that year inserted a provision in the new state constitution directing the legislature to "centralize" the record system. This directive found expression in the Montana Water Users Act of 1973, which instituted a statewide permit procedure for claiming surface water rights.[30] Even if the State of Montana had wanted to support ACM specifically through issuance of a water right, it was not in a position to have done so prior to the establishment of a centralized water rights system in 1973.

Finally, the claim that Montana's ownership and lease of a "school section" to ACM is illustrative of the state's "partnership" with ACM misrepresents the State Board of Land Commissioners' role in leasing state lands. The State of Montana, as did other states, received land from the federal government upon entering statehood, pursuant to the Ordinance of 1785. The Board of Land Commissioners began approving the leasing of state lands soon after Montana entered the union in 1889. In its second annual report in 1892, the board noted its authority to sell state lands, as well as to lease them. However, the board emphasized its desire

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[28] Stone, *Montana Water Law*, p. 3. The 1885 legislative session is known by Montana historians as the "Cowboy Legislature" because of the preponderance of ranchers in attendance. The fact that it was this legislature that passed a water statute that governed Montana water rights until 1973 suggests that the impetus for water law in the state was of great concern to agricultural interests in the territory. See Spence, *Territorial Politics*, pp. 209-210.

[29] Robert G. Dunbar, *Forging New Rights in Western Waters* (University of Nebraska Press: Lincoln, 1983) pp. 129-130.

[30] Ibid, pp. 131-132.

to seek a higher return over a longer period by retaining ownership of state lands. In that year, the state leased approximately 29,000 acres. By 1902, that number had risen to 1.6 million acres.[31]

The lease of section 36, Township 5 North, Range 10 West to the Anaconda Copper Mining Company was routine, undertaken as part of this broader program and does not represent a particular "partnership" between the state and ACM. The proceeds from the lease went to the benefit of the school fund as did the proceeds of other state leases. Moreover, the 1903 lease for this section specifically required that the lessee not "commit, or cause to be permitted, any waste in or upon said premises or any part thereof." This clause was a routine part of the lease, pursuant to Montana law.[32]

The Acquisition by the State of Montana of ACM "Resource Amenities" Does Not Evidence a "Partnership" between the Company and the State

The State of Montana has received certain properties from various entities in the state through acquisition, donations and exchanges. Some of these areas were once owned by the Anaconda Copper Mining Company or its affiliates. It is important to recognize the recreational value of many of these areas. But to argue ACM's beneficence in bestowing these "resource amenities" on the State of Montana is specious. The case of the Mount Haggin Area illustrates this point.[33]

Between 1905 and 1911, the ACM defended itself in federal court against numerous ranchers who claimed injury to their property from smoke emitted from the Anaconda Reduction Works. The Bliss Case, filed in 1905, dragged on for five years, eventually being

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[31] "Second Annual Report of the State Board of Land Commissioners For The Year 1892" (Helena: 1892), pp. 12-17. See also "Report of the Register of the State Land Office of The State of Montana For The Years 1901 and 1902" (Helena: 1902), p. 16.

[32] "Lease of State Lands," Section 36, T5N, R10W, November 4, 1903, UAR001100335-336. See also "The Codes and Statutes of Montana In Force July 1st, 1895 Including The Political Code, Civil Code, Code of Civil Procedure and Penal Code," Volume I (Intermountain Publishing Company, Butte: 1895), p. 452.

[33] During the earlier 1980s, I undertook an extensive historical review of the Mount Haggin Area for the Montana Department of Fish, Wildlife and Parks. Alan S. Newell, "Historic Resources Study: Mount Haggin Area, Deer Lodge County, Montana," prepared for Montana Department of Fish, Wildlife, and Parks (Bozeman, MT: June 30, 1980).

dismissed on appeal because of the inability of the plaintiffs to pay for a certified copy of the lower court record. Independent of the Bliss plaintiff's lawsuit, the United States began separate legal action against ACM, alleging that smelter smoke had also damaged national forest lands south of the plant. After much negotiation and political maneuvering, both parties agreed to settle the lawsuit by stipulated agreement.

As part of this settlement, the ACM acquired the smelter-fume-damaged 55,000 acres now known as the Mount Haggin Wildlife Management Area. Acting Regional Forester Elers Koch later justified the land exchange, in which the government received slightly more acreage in the Bitterroot Forest with a "higher producing capacity," by noting that "the consummation of the entire series of these exchanges will settle a long-standing controversy between the Government and the A.C.M. Co. existing from the injury of Government land and timber by the smelter fumes."[34]

The Mount Haggin area also figured in the company's efforts to defend against the Bliss case. As part of that defense, ACM had hired Dr. Henry C. Gardiner to investigate the extent to which emissions from the company smelter may have harmed the operations of Deer Lodge Valley farmers. Gardiner, with a group of other notable scientists, succeeded in demonstrating that the effects had not been appreciable.[35] After a 1909 decision denying an injunction to stop operation of the Washoe smelter, Gardiner continued in the employ of ACM, supervising the establishment of a model ranch on the Bliss property that ACM purchased after the 1909 decision. From this headquarters, Gardiner oversaw other ACM-owned experimental farms in the Deer Lodge Valley.[36] As part of this operation, the Mount Haggin Area served as summer pasturage for Gardiner's extensive Hampshire sheep herds, and for hay production.

Through various enterprises, Gardiner continued his operations at Mount Haggin until 1956, when he sold his company to Harry Ferguson, also an ACM employee. Not quite 10

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[34] Elers Koch, Acting Regional Forester, to Chief, U.S. Forest Service, Dec. 5, 1935, Division of Land Utilization, Purchase and Exchange Cases, Deerlodge National Forest, Records of the U.S. Forest Service, Record Group 95, National Archives — Washington, D.C.

[35] MacMillan, "A History of the Struggle to Abate Air Pollution from Copper Smelters of the Far West, 1885-1937," pp. 148-149.

[36] HRA interview with Henry E. Gardiner, June 2, 1980, Bozeman, Montana.

years later, in 1965, Ferguson and William O'Neil jointly formed a new company, the Mount Haggin Livestock Company. Also at this time, the partners acquired title to the Mount Haggin Area from ACM. In 1972, O'Neil bought Ferguson's interest in their company. By 1975, the Mount Haggin Livestock Company had sold its remaining sheep to an Idaho firm. In 1976, the Mount Haggin Livestock Company sold the Mount Haggin Area to the Nature Conservancy, who in turn donated it to the State of Montana.[37] This transaction may have transpired "with the cooperation of ACM,"[38] but it is inaccurate to suggest that this land was ACM's to give to Montana.

IV. Conclusion

Professor Emmons' crusade to re-interpret Montana's industrial past ultimately has little relevance to the issues addressed in my report. He does not contradict my statement as to the role played by ACM and its holding company, Amalgamated Copper Mining Company, in the consolidation of mining and smelting interests in Butte during the early 1900s. However broadly Emmons wants to interpret ACM's relationship to Montana as a "partnership," he does not and cannot argue that the company was not the principal controller and beneficiary of industrial activity in Butte and Anaconda after the consolidation of corporate interests during the first decade of the twentieth century (See Appendix A).

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[37] "Present Owner Record," Book no. 7, Records of the Deer Lodge County Assessor's Office, Anaconda, Montana. See also, HRA Interview with Henry E. Gardiner; HRA Interview with Jim Drummond, June 2, 1980, Bozeman, Montana. Funds from Montana hunting and fishing licenses and the Bureau of Outdoor Recreation were also used to acquire the Mount Haggin Area.

[38] Emmons Report, p. 109.

APPENDIX A

Production Tables, Sources, and Acronyms

APPENDIX A

Note: The State of Montana compiled a list of Butte-area mines that, at some point, were owned and/or operated by the Anaconda Copper Mining Company (ACM). The table prepared by the state included selected years of operation and production figures or other evidence of operation. The State asked me to review this table and to verify the information. I conducted this review by compiling the sources referenced in the table and checking them against the information provided by the state. I found only minor discrepancies in the state's original table.

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
Alice Mine owned by ACM - operated by lessees.		1918	Payroll	63
		1919	Construction expenditures	62
		1921	2,326.24 tons ore	58
		1922	2,508.60 tons ore	58
		1923	2,598.36 tons ore	58
Anaconda		1895 - 1940	9,249,670 dt Cu ore	25
	12	1904	25,361.56 tons ore	26
	03	1905	25,240.79 tons ore	26
	07 12	1905 1905	160,141.45 tons ore	26
	03	1906	29,670.45 tons ore	26
		1920	8,296 tons ore	58
		1921	2,671.05 tons Cu ore	58
		1922	132,450.25 tons Cu ore	58
		1923	197,321.95 tons Cu ore	58
Ancient		1917 - 1919	32,000 dt Mn ore	25
Andy Johnson (lease)		1916	Assessment work on claims	64
Anselmo		1927 - 1944	2,951,177 dt Cu ore	25
		1942	111 dt Mn ore	25
Badger State		1910 - 1944	7,941,800 dt Cu ore	25
		1921	117,663.20 tons Cu ore	58
		1922	287,530.20 tons Cu ore	58
		1923	317,770.20 tons Cu ore	58
Ball Eagle		1902	Payroll	60
		1913 - 1916	Assessment work on claims	64
Barnard Placer (lease)		1916	Assessment work on claims	64
Berkeley		1910 - 1924	1,973,003 dt Cu ore	25
		1923	140,314.50 tons Cu ore	58
Bell		1898	Shaft depth and men employed	55
		1900 - 1905	Payroll	60
	12	1904	21,012.66 tons ore	26
	03	1905	21,317.25 tons ore	26
	07 12	1905 1905	119,093.11 tons ore	26
	03	1906	20,882.69 tons ore	26

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
		1918	Number of men employed	58
		1920	Construction expenditures	62
		1923	243,092.00 tons Cu ore	58
Bell Diamond		1895 - 1928	7,900,822 dt Cu ore	25
Belmont		1906	Discussion of operations	62
		1907 - 1944	6,835,821 dt Cu ore	25
		1923	97,300.40 tons Cu ore	58
Blue Jay		1910 - 1911	4,545 dt Cu ore	25
Bonanza (lease)		1916	Assessment work on claims	64
		1918	Payroll	69
Buffalo		1906	Discussion of operations	64
Cambers		1905 - 1909	36,194 dt Cu ore	74
CanCan Mines owned by ACM - operated by lessees		1922	17.66 tons ore	58
Clarks Fraction		1919	Construction expenditures	62
Clear Grit		1910	5,795 dt Cu ore	25
		1910	Discussion of operations	44
		1911	Discussion of operations	58
Contention		1912 - 1914	Assessment work on claims	64
		1916	Assessment work on claims	64
Diamond		1898	Shaft depth & men employed	58
		1900 - 1905	Payroll	50
		1906	Discussion of operations	64
		1918	Discussion of operations	58
East Colusa		1910 - 1920	367,458 dt Cu ore	25
East Gray Rock		1910 - 1911	181,838 dt Cu ore	25
Eastern Morning Star		1913 - 1914	Assessment work on claims	64
Ella		1918	Discussion of operations	58
Elm Orlu/Poser		1928 - 1929	36,295 dt Cu ore	25
Emily		1917	Discussion of operations	69
Emma Mines leased and operated by ACM		1916	13,029.52 tons ore	73
		1917 - 1944	1,773,889 dt Mn ore	25
		1917	42,248.46 tons Zn ore	74
		1918	71,364 tons ore	75
		1918	Payroll	63
		1918	Construction expenditures	62
		1920	Construction expenditures	62
		1921	1,315.71 tons Zn ore	58
		1922	28,676.39 tons Zn ore	58
Fraction Mine Mine owned by ACM - operated by lessees		1921	307.12 tons ore	58
		1922	2,893.18 tons ore	58

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
		1923	60.17 tons ore	58
Gagnon		1910 - 1940	Figures incl. w/ Original	25
		1910	Discussion of operations	44
		1902	Discussion of operations	69
Gallatin	07 12	1905 1905	9,295.75 tons ore	26
	03	1906	2,591.75 tons ore	26
Mines owned by ACM - operated by lessees		1921	86.21 tons ore	58
Geneva (lease)		1916	Assessment work on claims	64
Gladstone		1902	Assessment work on claims	61
		1914 - 1917	Assessment work on claims	64
Gold Hill		1919 - 1920	Construction expenditures	62
Grant		1913 - 1917	Assessment work on claims	64
Gray Rock	12	1904	4,637.22 tons ore	26
	03	1905	4,370.46 tons ore	26
	07 12	1905 1905	14,581.98 tons ore	26
	03	1906	2,436.23 tons ore	26
Green Mountain & Wake up Jim		1895 - 1902	728,696 dt Cu ore	25
		1906	Shaft depth & men employed	55
		1900 - 1902	Payroll	69
Ground Squirrel	06	1895 - 1897	77,260 dt Cu ore	25
		1902	Assessment work on claims	61
		1913 - 1914	Assessment work on claims	64
Hancock Mines owned by ACM - operated by lessees		1921	179.96 tons ore	58
		1922	54.96 tons ore	58
		1923	951.67 tons ore	58
High Ore		1898 - 1923	3,811,572 dt Cu ore	25
	12	1904	12,773.18 tons ore	26
	03	1905	17,891.43 tons ore	26
	07 12	1905 1905	107,853.52 tons ore	26
	03	1905	21,519.36 tons ore	26
		1910	Discussion of operations	44
		1911	Discussion of operations	68
		1913	Number of men employed	58
		1923	569.40 tons Cu ore	58
High Rock		1902	Assessment work on claims	61
		1913 - 1915	Assessment work on claims	64
Henry George		1902	Assessment work on claims	61
		1913 - 1915	Assessment work on claims	64
		1917	Assessment work on claims	64

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
Holdfast Mines owned by ACM - operated by lessees		1913	Assessment work on claims	64
		1921	2,041.68 tons ore (Cu)	58
		1922	559.00 tons ore (Cu)	58
		1923	365.00 tons ore	58
Indian Queen		1923	7.94 tons ore	58
J.I.C.	03	1906	1,176.60 tons ore	26
		1913	Number of men employed	58
June Placer		1914	Assessment work on claims	64
Leonard 1 & 2		1916 - 1940	10,129,649 dt Cu ore	25
		1923	304,141.75 tons ore	58
Lexington		1916 - 1940	2,340 dt Cu ore	25
Little Mina		1910	Discussion of operations	44
Mary McLane Mines owned by ACM - operated by lessees		1921	119.26 tons ore	58
Mat		1895 - 1897	6,409 dt Cu ore	25
May		1913 - 1914	Assessment work on claims	64
Minnie Irvine Mines owned by ACM - operated by lessees		1921	39.36 tons ore	64
		1922	91.87 tons ore	58
		1923	212.25 tons ore	58
Minnie Jane		1942 - 1944	52,725 Mn ore	26
Modoc (includes Sunnyside)	06	1895 - 1897	18,890 dt Cu ore	25
		1912	Discussion of operations	58
		1913	Number of men employed	59
Monitor		1922	Assessment work on claims	61
		1913 - 1914	Assessment work on claims	64
		1916	Assessment work on claims	64
		1922	78.32 tons ore	58
		1923	215.99 tons ore	58
Moonlight		1910 - 1923	802,393 dt Cu ore	25
		1923	1,230.25 tons Cu ore	58
Mountain Con		1895 - 1944	12,878,772 dt Cu ore	26
		1898	Shaft depth & men employed	58
	12	1904	12,854.79 tons ore	26
	03	1905	15,956.07 tons ore	26
	07 12	1905 1905	102,295.12 tons ore	26
	03	1906	14,602.09 tons ore	26
		1923	255,078.45 tons Cu ore	58
Mountain View		1910 - 1944	4,458,925 dt Cu ore	25
		1923	300,082.50 tons Cu ore	58

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
Nettie		1918	Payroll	63
		1918	Construction expenditures	62
		1920	Construction expenditures	62
Nettie No. 3		1918	Payroll	63
		1919	Construction expenditures	62
		1920	13,396.60 tons Cu ore	58
		1922	57.70 tons Cu ore	58
		1923	35,598.85 tons Zn ore	58
Nettie Group		1913	Assessment work on claims	64
Never Sweat		1898	Shaft depth & men employed	55
		1900 - 1926	2,860,419 dt Cu ore	24
	12	1904	20,910.43 tons ore	26
	03	1905	24,503.43 tons ore	25
	07 12	1905 1905	75,660.36 tons ore	26
	03	1906	16,133.66 tons ore	25
		1920	333 tons ore	58
		1922	91,301.50 tons Cu ore	58
		1923	133,750.50 tons Cu ore	58
Nipper		1898	Shaft depth and men employed	55
None Such		1903 - 1904	Payroll	60
Norwich		1942 - 1944	7,045 dt Mn ore	25
Original		1909	19,088,260 lbs	51
		1910 - 1940	3,729,581 dt Cu ore	25
		1923	81,732.95 tons Cu ore	58
Orphan Girl (lease)		1918	Payroll	63
		1916	Construction expenditures	62
		1920	Construction expenditures	62
		1923	1,128.01 tons Zn ore	58
		1943	887 dt Cu ore	25
Otha		1918	Assessment work on claims	60
Pacific		1906	Discussion of operations	67
Pauline		1913	Discussion of operations	66
Paymaster Mines owned by ACM - operated by lessees.		1922	75.09 tons ore	58
		1923	35.71 tons ore	58
Pennsylvania		1910 - 1928	2,478,371 dt Cu ore	25
		1923	183,620.25 tons Cu ore	58
Pilot Butte		1916	Operated through Badger	25
Poulin		1910 - 1924 1940 - 1944	702,490 dt Cu ore	25
Rackarock		1902	Assessment work on claims	61
		1913 - 1915	Assessment work on claims	61

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
		1920 - 1922	Assessment work on claims	64
Ramsdell-Parrot		1898	Shaft depth and men employed	58
Rarus		1910 - 1944	Included w/ Tramway	25
		1910	Discussion of operations	44
		1918	Payroll	63
Reins		1913 - 1914	Operated thru Leonard	25
Rose		1902	Assessment work on claims	61
		1913 - 1916	Assessment work on claims	64
Silver Bow		1910	Discussion of operations	44
		1923	490.40 tons Cu ore	58
Silver Bow 1 & 2		1910 - 1923	777,228 dt Cu ore	25
		1913	Number of men employed	58
Silver Cleft (leased to ACM)		1942 - 1943	3,686 dt Cu ore	25
Silversmith (leased)		1880 - 1889	Discussion of expeditures	78
Smelter		1913 - 1915	Assessment work on claims	64
Smoke		1911	Assessment work on claims	64
Southern Cross		1910	Construction expenditure	62
Speculator & Granite Mountain (leased to ACM)		1942	280,823 tons	25
Steward		1911	Discussion of operations	58
		1913	Number of men employed	58
		1918	Payroll	63
		1921	52,757.15 tons Cu ore	58
		1922	37,291.65 tons Cu ore	58
		1923	201,538.00 tons Cu ore	58
St. Lawrence		1898	Shaft depth & men employed	55
	12	1904	19,874.15 tons ore	25
	03	1905	27,311.87 tons ore	25
	07 12	1905 1905	142,644.47 tons ore	25
	03	1898	21,756.50 tons ore	25
	06	1895 1944	7,122,297 dt Cu ore	25
		1921	2,380.35 tons Cu ore	58
		1902	12,497.10 tons Cu ore	58
		1923	136,313.10 tons Cu ore	58
Sunnyside	04	1905	Payroll	50
Surplus		1902	Assessment work on claims	61
T.H.G.		1913 - 1915	Assessment work on claims	64
Tramway		1910 - 1944	9,380,972 dt Cu ore	25
		1921	50,810.90 tons Cu ore	58
		1923	12,369.55 tons Cu ore	58
Travona		1942 - 1944	129,683 dt Mn ore	25

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA COPPER MINING COMPANY (ACM) MINES				
Tropic		1913	Number of men employed	59
		1918	Payroll	63
		1915 - 1920	143,236 dt Cu ore	25
Triple Shaft Mine leased and operated by ACM		1921	3,785.78 tons Zn ore	58
Valentine		1902	Assessment work on claims	61
		1913 - 1914	Assessment work on claims	64
		1916	Assessment work on claims	64
West Colusa		1910 - 1938	7,208,120 dt Cu ore	26
		1921	113,376.25 tons Cu ore	58
		1902	1,939.45 tons Cu ore	58
		1923	208,117.05 tons Cu ore	58
West Gray Rock		1915 - 1920	1,100,236 dt Cu ore	26
West Steward		1918	Discussion of operations	44
Wild Bill Mine owned by Butte and Boston (¼ interest)		1900 - 1910	116,400 dt Cu ore	24
	12	1904	6,891.16 tons ore	26
	03	1905	8,302.93 tons ore	26
	07 12	1905 1905	740.32 tons ore	26
	03	1906	336.69 tons ore	26

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA (COMPANY WIDE PRODUCTION)				
		1895	99,775,294 lbs Cu	37
		1895	125,350,693 lbs fine Cu	9, 20
		1897	131,471,127 lbs fine Cu	9
		1898	107,214,059 lbs fine Cu	9
		1899	107,914,357 lbs fine Cu 107,914,359 lbs fine Cu	9 20
		1900	125,011,944 lbs fine Cu	9
		1901	101,850,224 (est) lbs	9
		1902	75,000,000 (est) lbs 100,000,000 lbs	9 51
		1905	1,543,316 tons ore 95,443,730 lbs Cu	5 10
		1906	94,963,000 lbs Cu	10
		1907	63,055,661 lbs fine Cu 64,154,636 lbs Cu	10 21
		1906	67,064,000 lbs Cu	21
		1909	78,660,550 Cu	21
		1910	223,808,546 lbs	51
		1911	3,844,070.20 tons ore	68

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA (COMPANY WIDE PRODUCTION)				
		1912	4,486,872.98 tons ore	69
		1913	4,644,201.24 tons ore	70
		1914	3,898,100.15 tons ore	71
		1919	4,376,556.53 tons ore	72
		1919	5,582,076.52 tons ore	73
		1947	4,193,624.13 tons ore	74
		1918	293,603,726 lbs Cu 4,918,468 tons ore	53 75
		1919	150,000,000 lbs Cu	53
		1929	234,696,056 lbs Cu	57
		1929	298,952,569 lbs Cu	57
		1930	197,476,221 lbs Cu	57
		1934	189,612,775 lbs Cu	57
		1932	78,932,910 lbs Cu	57
		1938	59,551,500 lbs Cu	57
		1934	60,960,308 lbs Cu	57
		1938	152,159,534 lbs Cu	57
		1938	216,332,867 lbs Cu	57
		1932	297,661,167 lbs Cu	57
		1938	158,496,080 lbs Cu	57
		1939	203,955,367 lbs Cu	57
		1940	253,848,070 lbs Cu	57
		1941	246,243,122 lbs Cu	57
		1948	270,153,588 lbs Cu	57
		1943	264,475,992 lbs Cu	57
		1944	207,977,751 lbs Cu	57
		1945	149,880,860 lbs Cu	57
		1946	107,870,568 lbs Cu	57
		1947	104,531,946 lbs Cu	57
		1948	113,250,843 lbs Cu	57
		1948	107,809,185 lbs Cu	57
		1950	103,118,887 lbs Cu	57
		1951	99,451,998 lbs Cu	57
		1952	120,222,771 lbs Cu	57
		1958	163,093,470 lbs Cu	57
		1954	130,065,067 lbs Cu	57
		1955	183,899,533 lbs Cu	57
		1956	219,662,353 lbs Cu	57
		1957	221,028,093 lbs Cu	57
		1958	222,091,782 lbs Cu	57
		1959	160,825,402 lbs Cu	57
		1960	230,410,497 lbs Cu	57

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
ANACONDA (COMPANY WIDE PRODUCTION)				
		1961	251,925,864 lbs Cu	57
	01 05	1962 1962	109,017,238 lbs Cu	57

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BOSTON & MONTANA MINES				
Badger State / Moose Moose acquired by ACM, May 1910		1889 - 1944	7,981,272 dt Cu ore 326,643 dt Zn ore	24 24
Badger State		1899 - 1910	39,472 dt Cu ore	25
Colusa		1889 - 1890	49,476 tons	11
		1890 - 1891	46,679 tons	11
East Colusa		1893 - 1910	823,388 dt Cu ore	25
Acquired by ACM, May 1910		1890 - 1920	1,190,846 dt Cu ore	24
	03 12	1898 1899	7,141.742 fct ore 2,196.915 sct ore 152,746 dt Zn ore	30 30 24
		1904	189,161,099 lbs dry	27
Leonard		1891 - 1944	12,634,707 dt Cu ore 437 dt Zn ore	24 24
	03 09	1898 1899	3,757.96 fct ore 2,650.24 sct ore	30 30
		1904	504,015,368 lbs dry	27
	06	1905	12,197.45 tons ore	26
	07 12	1905 1905	6,521.69 tons ore	26
		1906	Discussion of operations	67
Leonard No. 1 & 2		1891 - 1910	2,505,058 dt Cu ore	25
Moose		1904	35,372 lbs dry	27
Mountain View		1889 - 1890	59,779 tons	11
		1890 - 1891	60,243 tons	11
		1891 - 1910	3,727,766 dt Cu ore	25
		1890 - 1940	8,186,691 dt Cu ore	24
		1904	489,478,085 lbs dry	27
	07 12	1905 1905	3,838.53 tons ore	26
		1906	Discussion of operations	67
Pennsylvania		1889 - 1890	32,013 tons	11
		1890 - 1891	25,341 tons	11
	03 09	1898 1899	10,409.693 fct ore 98,384.66 sct ore	30 30
		1890 - 1910	3,029,798 dt Cu ore	25
		1890 - 1928	5,508,169 dt Cu ore	24
		1904	470,400,424 lbs dry	27

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BOSTON & MONTANA MINES				
	07 12	1905 1905	6,997.49 tons ore	26
West Colusa		1887 - 1910	3,105,970 dt Cu ore	25
		1885 - 1938	10,314,090 dt Cu ore	24
	03 09	1898 1899	2,494.365 fct ore	30
		1904	494,329,043 lbs dry	27
	07 12	1905 1905	32,077.96 tons ore	26
		1906	Discussion of operations	67
Wrecked Ore		1904	76,040 lbs Cu ore	27

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BOSTON & MONTANA (COMPANY WIDE PRODUCTION)				
		1888	1,500,000 lbs. fine Cu	17
		1888	18,278,667 lbs. fine Cu	17
		1889	26,425,228 lbs. fine Cu	17
YE	06	1890	22,740 tons ore 26,003,604 lbs. fine Cu	11
		1890	26,942,298 lbs. fine Cu	17
YE		1891	23,734 tons ore 26,693,842 lbs. fine Cu	11
		1891	26,507,929 lbs. fine Cu	17
		1890	30,386,595 lbs. fine Cu	16
		1893	31,800,000 lbs. fine Cu	16, 20
		1894	50,000,000 lbs. Cu	51
		1895	55,000,000 lbs Cu	51
		1896	60,250,000 lbs fine Cu	9, 20
		1890	60,000,000 lbs fine Cu (est)	9
		1898	62,000,000 lbs fine Cu (est)	9
		1899	79,000,000 lbs fine Cu (est) 65,000,000 lbs Cu	9, 20 51
		1900	66,200,000 lbs fine Cu	9
		1901	58,028,746 lbs fine Cu (est) 70,000,000 lbs Cu	5 51
		1900	75,000,000 lbs fine Cu (est)	9
		1903	90,750,000 lbs Cu	51
		1900	94,000,000 lbs Cu	51
		1905	101,482,156 lbs Cu 89,000,000 lbs Cu	5 51
YE	06	1905	1,138,307 lbs Cu	9
		1906	93,461,344 lbs Cu	51
		1907	63,053,655 lbs Cu	21

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BOSTON & MONTANA (COMPANY WIDE PRODUCTION)				
		1908	77,010,800 lbs Cu 43,689,875 lbs Cu	21 51
		1909	79,049,150 lbs Cu 51,749,233 lbs Cu	21 51
		1910	85,644,511 lbs Cu	51

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BUTTE & BOSTON MINES				
Berkeley	03 09	1898 1899	12,881.29 tons	43
	04	1899	2227 tons	29
	02	1899	2013 tons	29
	03	1899	1283 tons	29
		1900 - 1910	629,626 dt Cu ore	29
		1900 - 1924	2,602,629 dry tons Cu ore	24
		1901	1,570.560 dt ore	30
Blue Jay	03 09	1898 1899	37,132.878 tons	43
	01	1899	2284 tons	29
	02	1899	1913 tons	29
	03	1899	1363 tons	29
	04	1899	1307 tons	29
	05	1899	2182 tons	29
	05	1899	2039 tons	29
		1901	16,331.804 dt ore	30
	05	1906	2,155,904 dry lbs	33
Dutton		1906 - 1916	105,000 dt Cu ore (est)	24
East Gray Rock	03 09	1898 1899	74,041.42 tons	43
	04	1899	3718 tons	29
	02	1899	2553 tons	29
	03	1899	5005 tons	29
	04	1899	1903 tons	29
	05	1899	5442 tons	29
	06	1899	5379 tons	29
		1900 - 1910	1,489,025 dt Cu ore	29
		1900 - 1910	1,670,863 dt Cu ore	24
		1901	82,608.818 dt ore	30
	05	1906	8,283.54 tons ore	29
	07 12	1905 1905	55,792.91 tons ore	26
	06	1906	21,687,688 dry lbs	33
Gray Rock	06	1904	4,298.20 tons ore	26

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BUTTE & BOSTON MINES				
	09	1904	4,261.10 tons ore	26
	12	1904	4,637.22 tons ore	26
	03	1905	4,370.46 tons ore	26
	06	1905	3,271.52 tons ore	26
	08	1905	2,839.11 tons ore	26
	07 12	1905 1905	14,581.98 tons ore	26
	06	1906	7,192,248 dry lbs	33
Kane No. 3		1906 - 1907	34,380 dt Cu ore	24, 25
	06	1906	1,928,895 dry lbs	33
Never Despair	03 09	1898 1899	4,045.205 tons	43
Silver Bow	03 09	1898 1899	61,395.005 tons	43
	01	1899	3702 tons	29
	02	1899	2981 tons	29
	03	1899	3498 tons	29
	04	1899	1862 tons	29
	09	1899	4002 tons	29
	06	1899	4002 tons	29
		1901	41,583.431 dt ore	38
	06	1905	7,899.35 tons ore	26
	07 12	1905 1905	42,141.59 tons ore	26
	06	1906	11,327,878 dry lbs	33
Silver Bow 1 & 2		1900 - 1923	2,107,419 dt Cu ore	24
		1900 - 1923	1,330,191 dt Cu ore	29
	09	1905	6,820.71 tons ore	26
Silver Bow No. 3		1906 - 1910	122,821 dt Cu ore	24, 25
Snohomish	03 09	1898 1899	1,520.995 tons	43
		1901	15,138.522 dt ore	30
		1907 - 1908	1,174 dt Cu ore (partial)	24
		1907 - 1908	587 dt Cu ore (partial)	29
Tramway	03 09	1898 1899	2,329.015 tons	43
		1901	1,375.449 dt ore	38
		1906 - 1944	9,526,799 dt Cu ore	24
		1906 - 1910	97,218 dt Cu ore	29
West Gray Rock	03 09	1898 1899	20.925 tons	43
		1900 - 1910	144,963 dt Cu ore	25
1910 - 1920 owned by ACM		1900 - 1920	1,245,199 dt Cu ore 120,853 dt Zn ore	24

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BUTTE & BOSTON MINES				
Wild Bill Reflects Butte & Boston's ¼ interest		1900 - 1910	29,100 dt Cu ore	25
	06	1904	401.76 tons ore	26
	09	1904	10,173.28 tons ore	26
	12	1904	6,891.16 tons ore	26
	08	1905	8,302.93 tons ore	26
	06	1905	627.44 tons ore	26
	06	1905	47.17 tons ore	26
(previous 6 months)	12	1905	740.32 tons ore	26
	06	1906	171,000 dry lbs	33

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
BUTTE & BOSTON (COMPANY WIDE PRODUCTION)				
		1898	7,000,000 lbs fine Cu	9
Reported with Boston & Montana		1899	79,000,000 lbs fine Cu 1,103,125 lbs fine Cu	9,20 17
		1900	10,000,000 lbs fine Cu	9
Reported with Boston & Montana		1901	58,028,746 lbs fine Cu (est)	9
	12	1902	3,019,901 lbs Cu	36
	01	1903	3,307,324 lbs Cu	36
	08	1903	2,835,232 lbs Cu	36
	09	1903	3,308,129 lbs Cu	36
	08	1903	3,266,010 lbs Cu	36
	05	1903	2,695,639 lbs Cu	36
	08	1903	2,198,957 lbs Cu	36
	07	1903	1,966,606 lbs Cu	36
	08	1903	2,096,954 lbs Cu	36
	09	1903	2,268,539 lbs Cu	36
	10	1903	1,954,545 lbs Cu	36
	12	1903	1,715,393 lbs Cu	36
	01	1904	1,908,814 lbs Cu	36
	02	1904	1,494,467 lbs Cu	36
	03	1904	1,576,791 lbs Cu	36
	04	1904	1,305,070 lbs Cu	36
YE	06	1905	260,433 tons Cu	6
YE	08	1908	331,630 tons ore	10
		1907	10,000,000 lbs fine Cu	10
YE	08	1908	193,830 tons ore	10
		1908	10,349,640 lbs Cu	21
		1909	14,010,500 lbs Cu	21

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
PARROT MINES				
Bellona		1898	Shaft depth & men employed	55
		1899 - 1910	82,866 dt Cu ore	24,25
		1899	1,638,208 lbs dry	32
Ore mined by Washoe Copper Co.	06	1904	652.85 tons ore	26
Ore mined by Washoe Copper Co.	09	1904	51.53 tons ore	26
Ore mined by Washoe Copper Co.	12	1904	1,263,25 tons ore	26
Ore mined by Washoe Copper Co.	03	1905	508.11 tons ore	26
Ore mined by Washoe Copper Co.	06	1905	586.98 tons ore	26
Ore mined by Washoe Copper Co.	07 12	1905 1905	3,365.53 tons ore	26
	07 12	1907 1907	4,515,341 lbs dry	32
	01 06	1908 1908	10,122,605 lbs dry	32
		1909	17,022,866 lbs dry	32
Colusa Parrot	09	1904	232.98 tons ore	26
Little Mina		1898	Shaft depth & men employed	55
		1899 - 1910	145,341 dt Cu ore	24,25
		1899	160,380 lbs dry	32
	07 12	1907 1907	4,596,233 lbs dry	32
	01 06	1908 1908	12,906,377 lbs dry	32
		1909	66,667,279 lbs dry	32
Original No. 6		1899	Shaft depth & men employed	55
		1899	971,504, lbs dry	32
		1904 - 1907	13,451 dt Cu ore	24,25
	09	1904	542.62 tons ore	26
	12	1904	303.63 tons ore	26
	03	1905	580.11 tons ore	26
	06	1905	352.02 tons ore	26
	07 12	1905 1905	2,462.27 tons ore	26
	07 12	1907 1907	1,483,044 lbs dry	32
Parrot		1884 - 1910	2,846,130 dt Cu ore	24,25
	06	1904	18,777.31 tons ore	26
	09	1904	17,129.88 tons ore	26
	12	1904	2,836.08 tons ore	26
	03	1905	15,240.28 tons ore	26

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
PARROT MINES				
	06	1905	12,350.94 tons ore	26
	07 12	1905 1905	79,692.25 tons ore	26
	07 12	1907 1907	50,331,044 lbs dry	32
	01 06	1908 1908	22,443,213 lbs dry	32

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
PARROT SILVER & COPPER COMPANY (COMPANY WIDE PRODUCTION)				
		1884	9,300,000 lbs Cu	38
		1885	9,809,000 lbs Cu	38
		1885	10,000,000 lbs Cu	38
		1887	10,000,000 lbs Cu	38
		1888	10,750,000 lbs Cu	38
		1888	9,500,000 lbs Cu	38
		1890	9,000,000 lbs Cu	38
		1892	12,438,782 lbs Cu	40
		1893	7,791,167 lbs Cu	41
		1894	7,469,908 lbs Cu	41
		1895	7,257,000 lbs Cu	41
		1896	8,045,648 lbs Cu	41
		1897	14,824,487 lbs Cu	42
		1898	12,444,828 lbs Cu	42
		1899	10,625,696 lbs Cu	42
	08 02	1899 1900	7,009,781 lbs ref Cu	35
	03	1900	1,201,668 lbs ref Cu	35
	06	1900	727,391 lbs ref Cu	35
	09	1900	281,991 lbs Cu	35
	12	1900	1,074,660 lbs Cu	35
	03	1901	1,022,847 lbs Cu	35
	06	1901	660,667 lbs Cu	35
	09	1901	1,064,332 lbs Cu	35
	12	1901	818,111 lbs Cu	35
	03	1902	1,290,010 lbs Cu	35

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
WASHOE MINES				
Blue Jay		1898	Shaft depth & men employed	55
		1907 - 1911	17,126 dt Cu ore	28
		1907 - 1911	12,581 dt Cu ore	25
	07 12	1905 1905	1,588.94 tons ore	26
Cambers		1903	2,922 tons ore	28
	12	1904	770.90 tons ore	28
	03	1905	2,181.48 tons ore	26
	06	1905	1,725.33 tons ore	26
	07 12	1905 1905	10,485.24 tons ore	26
Clear Grit		1902 - 1910	101,347 dt Cu ore	24
		1902 - 1910	95,352 dt Cu ore	28
		1903	5,271 tons ore	28
	06	1904	429.83 tons ore	28
	09	1904	509.52 tons ore	28
	12	1904	863.46 tons ore	28
	03	1905	1,062.21 tons ore	28
	06	1905	1,274.65 tons ore	28
	09	1905	1,010.74 tons ore	28
	07 12	1905 1905	6326.28 tons ore	26
Moonlight		1895 - 1923	874,202 dt Cu ore	25
		1903	72,977 tons ore	28
	06	1904	8,148.26 tons ore	26
	09	1904	8,269.34 tons ore	26
	12	1904	5,849.91 tons ore	26
	03	1905	6,520.71 tons ore	26
	06	1905	6,154.25 tons ore	26
	07 12	1905 1905	31,096.75 tons ore	26
Never Sweat		1903	158,095 tons ore	28
	12	1904	1,274.85 tons ore	26
	03	1905	2,257.63 tons ore	26
	06	1905	2,342.36 tons ore	26
	07 12	1905 1905	14,521.55 tons ore	26
Poulin	Est prior	1893	15,000 dt Ag ore	24

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
WASHOE MINES				
	06	1904	none	26
	07 12	1905 1905	74.53 tons ore	26
		1906 - 1924	1,073,663 dt Cu ore	24
Production from lessees		1906 - 1924 1940 - 1944	371,173 dt Cu ore	25
		1940 - 1944	484,948 dt Zn ore	24

Mine/Company	Month	Year(s)	Production Evidence of Operation	Source
WASHOE (COMPANY WIDE PRODUCTION)				
	11	1903	11,834,400 dry lbs	34
	12	1903	3,785,532 dry lbs	34
	01	1904	7,897,926 dry lbs	34
	02	1904	6,516,457 dry lbs	34
	03	1904	9,343,238 dry lbs	34
	04	1904	8,617,248 dry lbs	34
	05	1904	12,683,004 dry lbs	34
	06	1904	11,834,400 dry lbs	34
	02	1904	12,243,235 dry lbs	34
	02	1904	15,372,662 dry lbs	34
	09	1904	16,880,905 dry lbs	34
	10	1904	12,475,453 dry lbs	34
	11	1904	30,146,117 dry lbs	34
	12	1904	36,705,022 dry lbs	34
	01	1905	34,899,852 dry lbs	34
	02	1905	37,312,204 dry lbs	34
	03	1905	41,009,664 dry lbs	34
	04	1905	44,799,218 dry lbs	34
	05	1905	62,278,444 dry lbs	34
YE	06	1905	102,941 tons Cu	6
		1907	6,438,420 lbs Cu	21
		1908	8,569,176 lbs Cu	21
		1909	11,669,970 lbs Cu	21

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List of Acronyms Used

Ag	Silver
Cu	Copper
dt	dry ton
fct	first class ton
lbs	pounds
Mn	Manganese
sct	second class ton
ref	refined
YE	year end
Zn	Zinc